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| Notice of Allowability | Application No. | Applicant(s) | |
| | 10/085,312 | SUNTHANKAR ET AL. | |
| | Examiner | Art Unit | |
| | Rodney G. McDonald | 1753 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 3-21-05.
2. ☒ The allowed claim(s) is/are 1,3-7,9-16,18-23,26-28 and 30-37.
3. ☒ The drawings filed on 28 February 2002 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).


* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date <u>3/05, 1/05</u> | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |


RODNEY G. MCDONALD
 PRIMARY EXAMINER

REASONS FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance:

Claims 1 and 3-6 are allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including the constant contact mechanism with a rotating switch pole.

Claim 7 is allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including the current switching means further comprising a variable speed motor rotating a disc means having a conductive segment and a nonconductive segment, wherein the conductive segment alternately electrically contacts a contact node means.

Claims 9-12 are allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including wherein the rotating cathode current source contacts each fixed electrical contact hub to provide a momentary overlap of current between a pair of fixed electrical contact hubs before directing all the current to the next member of the pair of fixed electrical contact hubs, thereby causing the arc to be steered by the movement of current amongst the plurality of electrical contacts in a continuous manner without interruption.

Claim 13 is allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including wherein the rotating cathode current source contacts each fixed electrical contact hub to provide a momentary overlap of current between a pair of fixed electrical contact hubs before directing all the current to the next member of the pair of fixed electrical contact hubs, thereby causing

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the arc to be steered by the movement of current amongst the plurality of electrical contacts in a continuous manner without interruption; wherein the rotating cathode current source further comprises a disc having a peripheral contact edge, said edge having a conductive and a nonconductive segment; wherein the rotating cathode current source further comprises a central shaft supplying the cathode current to the conductive segment; and wherein a variable speed motor rotates the rotating cathode current source.

Claim 14 is allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including wherein the reciprocating cathode current source sequentially contacts each fixed contact hub to provide a momentary overlap of current before directing all the current to the next fixed contact hub to be contacted, thereby causing the arc to be steered by the movement of current between the plurality of cathode electrical contacts in a continuous manner without interruption.

Claim 15 is allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including a plurality of cathodes each having a plurality of electrical contacts; a switching cathode current source to provide an arc simultaneously to each cathode; said switching cathode current source having a separate switch for each cathode; and wherein the switching cathode current source contacts a first and a second electrical contact on each cathode to provide a momentary overlap of current between them before directing all the current to the next contact in line to be contacted, thereby causing several arcs each to be steered by the movement

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of current between the plurality of cathode electrical contacts on each cathode in a continuous manner without interruption.

Claims 16 and 37 are allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including the cathode body being positioned within said insulator member and said cathodic arc target being positioned in electrical contact with said cathode body, a gap between the cathode body and the insulator member, and a gap between the cathodic arc target and the insulator member; said insulator member cross-section having a "C" shape, with a pair of ends aligned with a plane of the target erosion surface; said cathode body having a back side; and a magnet mounted to the back side so as to face the insulator member.

Claim 18 is allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including each cathode having a plurality of electrical contacts; a cathode current controller; said cathode current controller having a current input, a plurality of current outputs, a logic module to control desired combinations of inputs to outputs; and wherein the cathode current controller for each cathode sequentially contacts a first and a second electrical contact to provide a momentary overlap of current between them before directing all the current to the second electrical contact, then repeating the process to the next in line to be contacted, thereby causing an arc on each cathode to be steered by the movement of the current between the plurality of cathode electrical contacts in a continuous manner without interruption.

Claim 19 is allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including the striker assembly comprising an electrically insulating solid core having a conductive outer surface; the conductive outer surface having a physical contact with the target; a switch connected between the striker's conductive outer surface and a source of a different potential than the cathode; wherein momentary closure of the switch causes a current flow through the conductive outer surface, thereby depleting the conductive outer surface and creating a spark to initiate an arc to an anode; and wherein the target re-coats the striker during a cathodic arc deposition process.

Claim 20 is allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including a time sharing frequency controller to control a time sharing frequency amongst the plurality of cathode contact nodes without the use of an arc sensor.

Claim 21 is allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including a time sharing frequency controller to control a time sharing frequency amongst the plurality of contact nodes without a use of an arc sensor, thereby allowing an arc to discharge continuously between the cathode and an anode.

Claim 22 is indicated as being allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including an arc to discharge continuously between the cathode and the anode; a target mounted to the

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cathode and having an erosion surface; and the erosion surface having a pattern of grooves, thereby causing a pattern of vapor flux to focus on a workpiece.

Claim 23 is allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including a time sharing frequency controller to control a time sharing frequency amongst the plurality of contact nodes without a use of an arc sensor, thereby allowing an arc to discharge continuously between the cathode and an anode; and wherein the cathode is powered by a pulsing current.

Claims 26 and 27 are allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including a switch connecting the negative pole to each contact node in a time sharing mode; the time sharing mode comprising a momentary overlap between switched members of the plurality of contact nodes without a use of an arc sensor.

Claim 28 is allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including a switch connecting the negative pole to each contact node in a time sharing mode; the time sharing mode comprising a momentary overlap between switched members of the plurality of contact nodes without a use of an arc sensor.

Claims 30-32 are allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including a time sharing frequency controller to control a time sharing frequency amongst the plurality of contact nodes without a use of an arc sensor, thereby allowing an arc to discharge continuously between the cathode and an anode.

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Claims 33-35 are allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including a current switching means functioning to controllably direct a current flow from one contact node means to another contact node means and provide a momentary overlap of the current between the first and second contact node means without a use of an arc sensor.

Claim 36 is allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including a time sharing frequency controller to control a time sharing frequency amongst the plurality of cathode contract nodes without a use of an arc sensor.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M- Th with Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Rodney G. McDonald
Primary Examiner
Art Unit 1753

RM
April 6, 2005